

I CLAIM:

1. A printing apparatus for printing indicia on a plurality of three-dimensional articles each having a first end, a second end, a longitudinal axis and a curved surface upon which the indicia is to be imprinted, the apparatus comprising:

(a) a supporting frame;

(b) a modified microprocessor-based printer assembly connected to said supporting frame for printing indicia based on printing instructions received from a microprocessor, said printer assembly including a carriage which carries at least one ink jet cartridge for movement with said supporting frame and means for controlling firing of the nozzle of the ink jet cartridge; and

(c) positioning means connected to said supporting frame for positioning a selected one of the plurality of three-dimensional articles relative to said printing assembly in a manner such that the longitudinal axis of the selected one of the plurality of three-dimensional articles is maintained within a plane that is substantially parallel to and spaced-apart from said carriage of said printing assembly, said positioning means comprising an article positioning assembly comprising:

(i) first and second spaced apart supporting wheels rotatably carried by said support frame;

(ii) wheel rotation means for controllably rotating said first and second spaced apart supporting wheels;

(iii) a plurality of circumferentially spaced apart first gripping means connected to said first supporting wheel for gripping the first end of a selected one of the plurality of three-dimensional articles, each of said plurality of spaced apart first gripping means comprising a first, generally cup shaped member that is movable from a first position spaced apart from said first supporting wheel to a second position proximate said first supporting wheel;

(iv) a plurality of circumferentially spaced apart second gripping means for gripping the second end of a selected one of the plurality of the three-dimensional articles; and

(v) article rotating means connected to said supporting frame for controllably rotating a selected one of said plurality of second gripping means.

2. The printing apparatus as defined in claim 1 in which said second gripping means includes a driven shaft and a second generally cup shaped member

connected to said driven shaft for rotation there with, said shaft being rotatably supported by said second wheel.

3. The printing apparatus as defined in claim 2 in which said article rotating means comprises: and

(a) a drive shaft;

(b) motor means for rotating said drive shaft;

(c) interconnection means for interconnecting said drive shaft with said driven shaft for imparting rotation thereto upon rotation of said drive shaft by said motor means.

4. The printing apparatus as defined in claim 2 in which said supporting frame comprises first and second spaced apart sides and in which said wheel rotating means comprises an axle rotatably supported by said first and second sides, said first and second wheels being connected to said axle for rotation there with.

5. The printing apparatus as defined in claim 4 in which said wheel rotating means further comprises means for controllably rotating said axle.

6. The printing apparatus as defined in claim 5 in which said first gripping means includes a shaft, said first generally cup shaped member being connected to said shaft for rotation there with, said shaft being rotatably supported by said first wheel.

7. The printing apparatus as defined in claim 6, further including biasing means for yieldably resisting movement of said first generally cup shaped member of said first gripping means from a first position spaced apart from said first supporting wheel to a second position proximate said first supporting wheel.

8. The printing apparatus as defined in claim 7 in which said biasing means comprises a coil spring circumscribing said shaft of said first gripping means.

9. In combination with a modified microprocessor-based printer that produces copies of computer data based on printing instructions received from a host computer, said printer being of a character having a carriage which carries at least one ink jet cartridge for movement along the length of the print zone of the printer within a first plane and means for controlling firing of the nozzle of the ink jet cartridge, the improvement comprising positioning means for positioning a plurality of three-dimensional articles, each having first and second ends and a longitudinal axis, relative to the printer in a manner such that the longitudinal axis of the article is at all times during the printing operation maintained within a second plane that is parallel to and spaced-apart from the first plane, said positioning means comprising an article positioning assembly comprising:

- (a) a supporting frame having first and second spaced apart sides;
- (b) an axle rotatably supported by said first and second sides;

(c) first and second supporting wheels connected to said axle at spaced apart locations;

(d) wheel rotation means connected to said frame for controllably rotating said axle and said first and second spaced apart supporting wheels;

(e) a plurality of circumferentially spaced apart first gripping means connected to said first supporting wheel for gripping the first end of a selected one of the plurality of three-dimensional articles, each of said plurality of spaced apart first gripping means comprising a first generally cup shaped member that is movable from a first position spaced apart from said first supporting wheel to a second position proximate said first supporting wheel;

(f) a plurality of circumferentially spaced apart second gripping means rotatably connected to said second wheel for gripping the second end of a selected one of the plurality of the three-dimensional articles, each of said second gripping means comprising a driven shaft and a generally cup shaped member connected to said driven shaft for rotation there with;

(g) article rotating means connected to said supporting frame for controllably rotating a selected one of said driven shafts of said plurality of second gripping means, said article rotating means comprising:

(i) a drive shaft movable between a first retracted position and a second extended position;

(ii) motor means for rotating said drive shaft; and

(iii) interconnection means for interconnecting said drive shaft with said driven shaft for imparting rotation thereto upon rotation of said drive shaft by said motor means.

10. The combination as defined in claim 9 in which said interconnection means comprises a solenoid assembly carried by said frame and operably associated with said drive shaft for moving said drive shaft between said first and second positions.

11. The combination as defined in claim 10 in which said driven shaft is provided with a tapered socket and in which said drive shaft is provided with a tapered end receivable within in said tapered socket.

12. A method for imprinting an image on a portion of the surface of a baseball bat by using a modified microprocessor-based printer that includes control circuitry that functions to cause the printer to produce a copy of computer data based on printing instructions received from a host computer, the printer being of a character having a carriage which carries at least one ink jet cartridge having a nozzle for movement along the length of the print zone of the printer within a first plane and means for controlling the firing of the nozzle of the ink jet cartridge, the

modified microprocessor based printer comprising an article positioning assembly for holding a plurality of circumferentially spaced apart bats in a manner such that the bats can be sequentially moved into a position proximate the nozzle of the ink jet cartridge, said method comprising the steps of:

- (a) analyzing the baseball bat to determine the configuration of the portion of the surface of the baseball bat that is to be imprinted;
- (b) positioning a plurality of baseball bats within the article positioning assembly;
- (c) rotating said article positioning assembly to bring a selected one of said plurality of baseball bats into proximity with the nozzle of the ink jet cartridge;
- (d) rotating said selected one of the baseball bats about its longitudinal axis;
- (e) producing a non-distorted image;
- (f) distorting said non-distorted image in a manner to produce a distorted image that generally corresponds with the surface of the baseball bat that is to be imprinted;
- (g) using the host computer, transmitting the printer instructions to the printer instructing the printer to fire the nozzle of the ink jet cartridge in a manner to print said distorted image on the rotating baseball bat.

13. The method as defined in claim 12 in which the modified printer carries a plurality of ink jet cartridges each having a nozzle and in which the printer is instructed by the host computer to fire the nozzles of the plurality of ink jet cartridges to produce the distorted image on the rotating baseball bat.

14. The method as defined in claim 13 in which the image depicts a human figure.